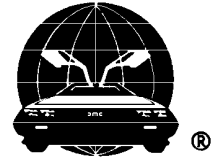


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DeLorean Owners Association Regional Chapter 41



January 14, 1996

DeLorean Expo '95

by Knut Grimsrud

As promised in my last newsletter, this issue includes a brief writeup of DeLorean Expo '95 in an attempt to make you regret not having attended. Unfortunately, I developed the wrong roll of film, so you will have to wait until the next issue for the photos.

The expo was in Las Vegas this year, which is as close as it's been in the past several years and the turnout was pretty good (likely due in part to its close proximity to the large chapters in California). While many of the cars that arrived were indeed from the west coast area, one member drove his car all the way from the east coast to attend the expo with his shining beauty, and there was a surprising showing from the midwest and rocky mountain states as well.

I am a little ashamed to admit that I flew down for the show, but as you know, my clutch gave out a couple hundred miles after I got back from the show due to some stress I put on it at the races. I estimate that there were between 50 and 60 cars present for the show this year (DeLorean World will likely publish the exact number and embarrass my estimation) and about 100 enthusiasts showed up for the show. One interesting statistic about the cars in attendance -- none were painted. At the risk of being assaulted by owners of painted DeLoreans, I will go out on a limb and theorize that the expo appeals mostly to the DeLorean purists out there.

Hotel arrangements were made at the Rio Hotel which is a little ways off the strip. This hotel features all suites accommodations and I found

the fare of \$99 per night to be extremely reasonable in light of the accommodations. The program was filled with events that ranged from receptions to Las Vegas shows to a scenic cruise with a picnic. I particularly enjoyed the products fair which was a feeding frenzy. The original blueprints to the Dunmurry DMC factory sold for \$200 and there was nothing which could not be had for a price. I made off with a DMC service manager's tie and tie tack for a reasonable sum and the trinkets and DMC parts to be had could make your eyes glaze over. I am happy to report that several DMC suppliers are gearing up production of aftermarket equivalents for parts that have become particularly scarce.

Of the entertainment events, we particularly enjoyed the *Cirque du Soleil* at Treasure Island. This new age circus was astounding and was a real experience worth every penny. Highly recommended.

Continued on last page

Message From Your Coordinator

by Knut Grimsrud

We have had no events since my last newsletter due to poor conditions and modest event turnout. We are starting off 1996 with a host of new events that you will hopefully find interesting. More on that in the **Upcoming Events** section.

With this issue, I will try to make your newsletter more interesting by inviting guest contributions from club members and other experts I can con into providing material, as well as trying my hand at formatting the newsletter in a slightly more appealing way. If you have comments or would like to contribute some material, please let me know.

Stainless Steel Isn't

Contributing article by Helga Grimsrud

WARNING!! Your tough, indestructible stainless steel DeLorean is not stainless. It is, however, heat and corrosion resistant. Feel free to dip your car in nitric acid, but be sure to rinse the blood off your car immediately if you run over the neighbor's dog, or you'll never be able to hide the evidence.

There are more than 70 standard types of stainless steels and many special alloys. There are three groups of stainless alloys: martensitic, ferritic, and austenitic. The DeLorean is manufactured from SS 304, an austenitic alloy. 304 was probably chosen because, even though all austenitic alloys have good machinability properties and are much more corrosion resistant than other alloys, 304 has the best ability to elongate (or stretch) -- clearly an advantage when you're after that sleek stealth-fighter look in the body. If you tried to build a DeLorean from another type of stainless, it may have to look more like a Volvo.

SS 304 contains mainly iron, with 18-20% chromium for corrosion resistance and a healthy, shiny coat, along with 8-10% nickel to reduce the brittleness of your car so that it doesn't shatter upon impact and to make it easier to machine. The high temperatures involved in welding stainless steels may result in a precipitation of chromium carbide at the grain boundary, resulting in decreased corrosion resistance along the weld. 304 has a very low carbon content (.08%), so this shouldn't be a concern, but it might not be a bad idea to rinse your welds with water now and then.

SS 304 exhibits the best resistance to corrosion when the surface is oxidized to a "passive" state. This condition can be obtained by a process where the surface is treated with nitric acid and then rinsed with water. Localized corrosion can occur at places where foreign material collects, such as scratches, crevices, or corners. Therefore, marks or scratches should be avoided

(no SOS pads), and hopefully, the body shape is designed to minimize sharp corners, seams, and joints. If you should get a scratch, about the only thing you can do is keep it clean.

Materials containing metals or iron compounds often tend to be reducing agents and quickly cut through the protective oxidized layer to stain the metal. Don't forget that common things, such as blood and tools, contain/are metal or iron compounds and can stain your car. For those who have acquired a DeLorean that has been painted and you would like it returned to its original state, that may be difficult, depending on the process used. If the treatment used to prime the surface for painting has damaged the oxidized layer, the car may never be stain or corrosion resistant again. However, it will still be heat resistant. Stainless steel 304 melts at temperatures between 2550-2650 Fahrenheit. So if your air conditioner can take it, so can the car (the body, at least).

Things to avoid getting in contact with your car:

- anything containing chlorine
- anything with metal or iron (do **not** use SOS pad on your stainless steel panels)
- phosphoric acid (often used in rust deactivators)
- salt in solution (road salt)
- seawater
- acid rain

Your car will be fine with:

- caustic and mild alkalis, including ammonium hydroxide
- nitric acid
- peroxides
- fresh water
- high humidity
- smog

Editor's Note: Helga Grimsrud has a master's degree in chemical engineering and is currently working for IBM in the Denver area. If you assumed she is my sister, you assumed right.



To Drive or Not to Drive

Contributing article by Chris Myers

Owning a special-interest auto is often an experience that is a combination of considerable pleasure balanced with a fair measure of anxiety and financial trauma from time to time. This applies to those of us who are known as “enthusiasts” or “car nuts.” The pleasure, of course, comes in owning and driving an automobile that is unique in some way -- say a limited production model, an auto that may have classic or advanced design features, or an interesting heritage for example. The DeLorean certainly qualifies in all these categories.

The downside of the relationship, as many DMC owners are aware, lies with the fact that the same features that make the car great also make it a challenge to one's sensibility and pocket book to own. As a result, many owners let their cars languish, idle, in their garages waiting for the perfect day to emerge and enjoy the driving experience that is the best part of owning the car.

There are many reasons or justifications to let a specialty car become a “garage queen.” Some cars may be considered too rare and valuable to risk driving on a regular basis. There are cars in this category, I for one, do not feel that the DeLorean is one of them, not yet anyway.

The pros of driving your DMC rather than “banking” or storing it are much greater than the cons. Being involved in the auto service industry, and having serviced DMC's now for approximately 10 years, I can definitely say that the most prevalent and costly repairs are those on very low mileage cars. For example, having to overhaul the entire brake hydraulic system on an '81 model DMC with approximately 5000 miles. The repair cost was not great compared to the national debt, but the expense could have been avoided if the car had been driven more or if the brake hydraulic system had been flushed every 1½-2 years to purge the system of accumulated moisture.

Moisture enters the system due to the hygroscopic nature of brake fluid. This moisture accumulation not only promotes corrosion within the system that results in leakage and binding of its components, but also lowers the brake fluid's boiling point -- brake fade is more likely to occur in a car with old brake fluid.

Deterioration of the fuel injection system also can take place when a car is rarely driven. Moisture that may enter the fuel system with the gasoline may find its way to various injection components and, if allowed to rest for extended periods of time, causes corrosion and malfunction of those parts.

The cooling system is another area that doesn't fare well under long periods of storage. Due to the common use of dissimilar metals in automotive cooling systems -- aluminum, steel, cast iron, copper, and brass -- electrolysis can occur if the antifreeze isn't replaced regularly. The pH of antifreeze changes over time and will promote corrosion of castings and other coolant-bearing parts of the cooling system. And since rubber parts deteriorate as time passes as well as from exposure to the elements, these too are affected by non-use.

Simply starting and running a stored auto's engine for a few minutes once in a while may seem like a good idea, but really can do more harm than good. Unless an engine is allowed to run long enough to reach normal operating temperature, condensation is likely to accumulate in the crankcase, combining with combustion byproducts to form a corrosive element. Also, the car should actually be driven so that moving parts in the drive train get rotated and lubricated a bit.

Batteries also suffer from non-use. Some batteries, depending on their construction, may undergo a chemical breakdown known as “sulphation” that damages the battery's ability to take and store a charge. This happens frequently with batteries that are discharged repeatedly or are not fully charged for long periods of time.

Continued on last page

Tech Notes

by Knut Grimsrud

In my previous newsletter I started covering some of the electrical aspects of the car and I will continue with more of the same (since this is the only area in which I have any qualifications). In this issue, I will examine electrical issues with the fuel delivery system as well as cover the next installment of the fan override switch project which will eventually blossom into a full-blown systems control and monitoring system by the time it is all said and done.

Fuel Pump Electronics

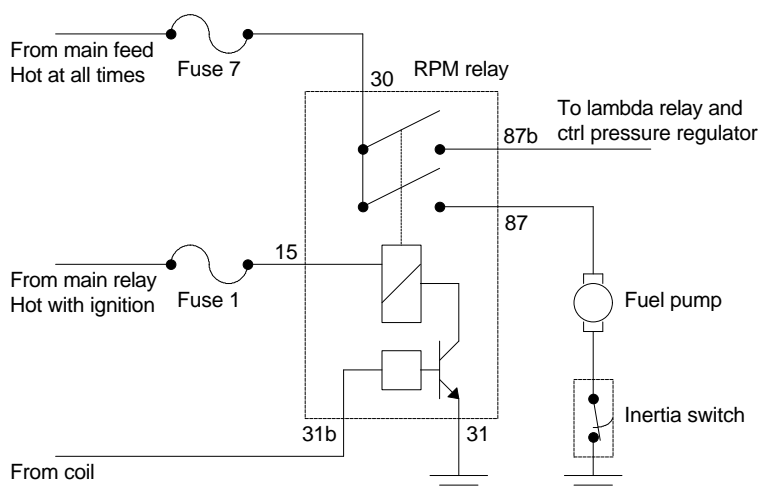
I have been in contact with several people over the internet that have had problems diagnosing problems with the electrical system related to the fuel pump, so I thought a brief tutorial on the operation of the electrical system with regard to this would be useful.

The fuel pump electrical system is conceptually very simple. The diagram in the figure shows the overall block diagram for the fuel pump circuit.

There are only two modules (aside from the fuel pump itself) in the electrical circuit involving the fuel pump -- the **RPM relay** and the **inertia switch**. Both of these are related to safety aspects of the car.

What's an RPM relay you ask? The function of the RPM relay is to provide power to your fuel pump only if the engine is running (i.e. if you have some RPM's, got it?). This prevents the fuel pump from running when the ignition is on but the engine is not running. The RPM relay is the same as the fuel pump relay on a 1980 240 series Volvo (Chris Myers knows the exact part number if you are interested). It is located in the relay compartment behind the passenger's seat and is one of the big modules mounted separately near the back of the compartment. The main feed, which is hot at all times, is provided to the relay

and this feed is switched to the fuel pump by the relay circuitry. The relay circuitry activates if the ignition is in the **Run** or **Start** position and it receives a pulse from the ignition coil at least once per second. The fuel pump may continue to run for up to a second after the engine stops before the RPM switch detects the engine is stopped and cuts the power. Have you ever



thought about adding automatic daytime running lights to your car? Well, the RPM relay is the place to get the signal from to drive such a circuit if you want the lights on only if the engine is running.

The symptoms of a failing RPM relay include a chatter sound produced by the relay when the engine is running (the frequency of the chatter often varies with the RPMs) or no power to the fuel pump at all. The chatter is caused by the relay not "holding" the contacts closed for the required 1 second after the previous coil signal,

causing it to engage and disengage with each coil signal it receives.

The inertia switch provides the ground circuit to the electric fuel pump. It is located in the footwell near where the driver's left foot would normally rest. In the event of a collision, the inertia switch will break the ground circuit preventing the fuel pump from pumping fuel through possibly ruptured lines. The inertia switch also unlocks the doors in the event of a collision. Early cars were recalled due to faulty inertia switches which would sometimes leave motorists unexpectedly stranded due to it tripping on its own accord. If you are concerned about your car being stolen while storing it for periods, you can manually trip the inertia switch by sliding the plunger on the switch. Since the switch was not designed for a large number of cycles, it is not recommended that this technique be used for daily auto security.

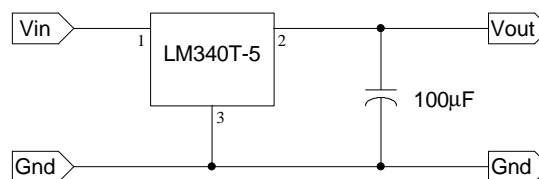
I was speculating the other day whether one could break into a locked DeLorean by striking the driver's footwell (directly opposite the inertia switch) with a rubber mallet. After checking the electrical diagrams, I found that the inertia switch generates the signal to unlock the doors using power from the fuel pump, so you can only break into a running DeLorean using the rubber mallet approach.

Manual Fan Override Project

The next series of tech notes will build a system that can be used for a variety of auto control functions, including elimination of the pesky switch we added for our fan bypass circuit in the last issue. Because of space limitations in this issue and in order to help you understand the various parts of the system (as well as to avoid overwhelming you), I will start off very simply by providing only a small self-contained portion of the controller.

For most logic controllers I find the use of standard logic parts (often referred to as TTL

integrated circuits) to be the simplest solution. TTL parts require a 5V DC power supply, so at the heart of such controllers is a 5V DC voltage regulator. A DC voltage regulator takes a DC input voltage that may vary over a relatively broad range of voltages and regulates it down to a constant output, provided that the input voltage is higher than the regulated output voltage. Because the voltage in your car is nowhere near a constant 12V (while cranking it will dip down significantly and while charging it rises to around 13V or so) we use a voltage regulator to provide a stable power supply for our project.



The figure shows a simple voltage regulator circuit that consists of just two parts -- a 5V DC voltage regulator chip and a capacitor. The voltage regulator can be purchased from Radio Shack (part number 276-1770) for \$1.49 as can the capacitor (part number 272-1028 for \$0.99). The value of the capacitor is not particularly important as it is only used to "smooth out" any left over ripple in the regulated output voltage. Make note that the capacitor is polarity sensitive -- the marked lead goes to the negative (ground) connection. This simple circuit is sufficient to provide most small projects with clean 5V power.

A second component that is often very useful in logic controller designs is a clocking circuit to provide a series of timing pulses. The output of a clocking circuit can be thought of as the equivalent of the pulsing car alarm light you see in most cars these days (in fact you can attach an LED or other lamp to the output of the clocking circuit I will show you to give you simply a pulsing light which some people use as a dummy car alarm).

At the heart of the clocking circuit is the 555 timer chip which you can purchase from Radio Shack (part number 276-1723) for \$1.19. This timer chip, incidentally, is the same as is used in the RPM relay I talked about earlier to provide the 1 second persistence in the relay actuator and is often the culprit in failed RPM relays. Because of its versatility, I will not go into detail on the function on the chip other than showing you how to hook it up to create a pulsing circuit.

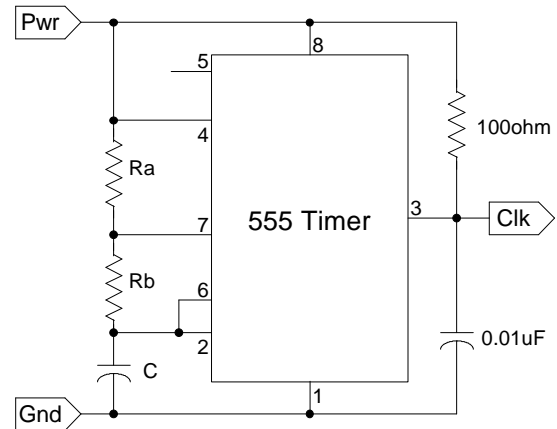
The figure illustrates the circuit which consists of the timer chip, two capacitors, and three resistors. Since we will be using the circuit to drive our TTL parts, the circuit must be powered by the 5V supply. The circuit will work fine powered directly off the car's 12V supply as well, if you have other ideas in mind (the 100ohm load resistor should be substituted with one of higher resistance if the chip is driven by a higher source voltage).

The frequency of the pulsing can be adjusted by properly sizing the resistors R_A and R_B as well as the capacitor C . The frequency is given by:

$$f = \frac{1.44}{(R_A + 2 \cdot R_B) \cdot C}$$

Also, the duty cycle of the pulsing can be adjusted by changing the relationship between the

value of resistors R_A and R_B . For convenience, I usually leave the size of the two resistors equal which gives an acceptable duty cycle for nearly anything you will do with the timer. By selecting the resistor values to be 4.7Kohm and the capacitor to be 4.7uF, the resultant pulse frequency is about 30 times per second which is suitable for this project.



In the next issue I will illustrate simple circuits for receiving input signals from various car systems as well as providing output drive to various systems.

Editor's Note: Anyone who can actually make sense of these articles and complete a project will be awarded an honorary engineering degree by Chapter 41.



DeLorean Texturing Jig

I recently found out who bought the DeLorean body texturing jig from Val's Autobody. I am attempting to recruit him as a new member and hope to feature the texturing jig in our summer BBQ and tech session. Having access to this equipment would be a valuable asset to our local chapter.

John Z. Turns 71

In the midst of renewed financial turmoil, John Z. turns 71 years in January. On behalf of Regional Chapter 41 I sent a card with our warmest wishes. His current financial problems are outlined in a half page article in Fortune magazine (Vol. 132, No. 13, Dec. 25, 1995, pg. 48) which writes:

"Merril Lynch moved to recently foreclose on a pair of mortgages, totaling \$8 million, on DeLorean's 434-acre estate, located near the properties of such big wallets as former U.S. Treasurer Nicholas Brady, candy baroness Jacqueline Mars Vogel, and a local presidential aspirant named Steve Forbes."

To Drive or Not...

Continued from page 3

Basically, if you plan on storing your car for months or years at a time, there are proper preventative maintenance steps that should be taken. The details of these can be discussed in length, perhaps in another article.

I don't mean to give the impression that a car must be driven every day, or it will fall to pieces, although some DMC owners do drive their cars daily, but driving your pride and joy more than once or twice every 2-3 months can be beneficial for the car and add to the enjoyment of ownership as the same time. Of course, given the choice of driving on a sunny day or a rainy one, the sunny day wins hands down. True, the Pacific Northwest may lack an abundance of sunny days, but what better car to drive on a rainy day than one that doesn't rust?

Editor's Note: Chris Myers is the Technical Director for Chapter 41 and the service manager at Foreign Car Specialists. He can be reached at 357-7049.



Expo '95 ...

Continued from page 1

While the technical seminars were generally informative, I personally found a couple of them to be a little too much like "Infomercials" for my taste. I found Rob Grady's tech session the most informative partly due to the broad range of technical questions he entertained.



Chapter 41 Events Calendar

1996 Kickoff Pizza Party

Date: Sat. Feb. 10
Time: 5:00pm-7:00pm
Place: Round Table Pizza, Tannasbourne Mall
2473NW 185th Avenue, Beaverton (Highway 26 to 185th Ave)
Agenda: Annual chapter business
Finalize 1996 events
Enjoy some pizza in good company

Upcoming events (to be finalized)

Sat. Mar 16 St. Patrick's Day event
This is the only event we schedule that provides us exposure and publicity. As part of the Portland St. Patrick's Day Festival, we drew a great response last year.

Sun. May 5 Cruise up the Gorge for Sunday brunch

Sat. Jun. 15 Summer tech session and BBQ

For Sale & Wanted

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DeLorean related items is
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Chapter 41 members free
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